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CLAIMS:

We claim:

1. A synthetic or recombinant human telomerase reverse transcriptase (hTERT) protein, or a variant thereof, or a fragment thereof, wherein said variant is encoded by a polynucleotide that hybridizes under stringent conditions to a polynucleotide having a sequence complementary to SEQ ID NO: 224, and wherein said hTERT protein, variant, or fragment has telomerase catalytic activity when complexed with a telomerase RNA.
2. A composition comprising the hTERT protein of claim 1, and further comprising an RNA, wherein the hTERT protein and the RNA form a telomerase ribonucleic acid complex.
3. An isolated, synthetic, substantially pure, or recombinant polynucleotide comprising a nucleic acid sequence that encodes the hTERT protein, variant or fragment of claim 1, or the complement of said nucleic acid sequence.
4. The polynucleotide of claim 1, comprising a promoter sequence operably linked to the sequence encoding the hTERT protein.

5. A isolated cell comprising the recombinant polynucleotide of claim 3.
6. A cell of claim 5 that is a eukaryotic cell.
7. An isolated, synthetic, substantially pure, or recombinant polynucleotide encoding a full-length naturally occurring human telomerase reverse transcriptase (hTERT) protein, said protein having 1132 amino acid residues.
8. An isolated, synthetic, substantially pure, or recombinant polynucleotide encoding a full-length naturally occurring human telomerase reverse transcriptase (hTERT) protein, said protein having 1132 amino acid residues, wherein said polynucleotide comprises the hTERT protein encoding sequence of bases 56 to 3451 of Seq. ID. No. 224 (FIG. 53).
9. The polynucleotide of claim 3, wherein the encoded protein has 1132 amino acid residues.
10. The polynucleotide of claim 9, wherein said polynucleotide comprises an encoding region of bases 56-3451 of SEQ ID NO: 224.
11. A method of preparing recombinant telomerase, said method comprising contacting the recombinant hTERT protein of claim 1 with a telomerase RNA component under conditions such that said recombinant protein and said telomerase RNA component associate to form a telomerase enzyme capable of catalyzing the addition of nucleotides to a telomerase substrate.
12. The method of claim 11, wherein said contacting occurs in a cell which has been engineered to express recombinant hTERT.